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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/989,962

11/21/2001

Hidefumi Nakata

P/1071-1504

1666

7590

02/03/2005

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EXAMINER

DIAZ, JOSE R

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/989,962

Applicant(s)

NAKATA, HIDEFUMI

Examiner

José R. Díaz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/24/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemnios et al. (US Pat. No. 5,162,258) in view of Terakado et al. (JP 07161833 A), cited by Applicant.

Regarding claims 1, 14 and 11, Lemnios et al. teaches an MIM capacitor comprising:

a lower electrode (85) comprising a first titanium layer, a platinum layer, a gold layer, and a second titanium layer (see Fig. 7 and col. 6, line 47) ¹;

an upper electrode (101) (see fig. 7); and

a dielectric layer (92) positioned between said lower electrode and said upper electrode (see fig. 7),

However, Lemnios et al. fails to teach an insulating metal oxide layer disposed over the lower electrode.

¹ It is noted that Lemnios et al. uses the term "alloy" to describe the Ti/Pt/Au/Ti layer (see col. 6, line 47). However, the term "alloy", contrary to its ordinary meaning, is used to describe a stack of metal layers. Please note that Ti/Pt/Au/Ti includes two separated titanium layers, one adjacent to the platinum and the other adjacent to the gold. In addition, see column 6, line 5 in which Lemnios et al. discloses a multimetal layer, which includes a layer made of AuGe alloy adjacent to a nickel layer.

Terakado et al. teaches that it is well known in the art to form a titanium oxide layer (102) from a lower titanium electrode (101), and in direct contact with a surface of a dielectric layer (103) (See abstract).

Lemnios et al. and Terakado et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a titanium oxide layer disposed on the entire surface of the second titanium layer, and in direct contact with a surface of the dielectric layer. The motivation for doing so, as is taught by Terakado et al., is reducing a leakage current of a capacitor (See PURPOSE). Therefore, it would have been obvious to combine Terakado et al. with Lemnios et al. to obtain the invention of claims 1-5, 11 and 13-15.

Regarding claims 2 and 3, Lemnios et al. teaches that titanium (Ti) is one of the top metal layers of the electrode (85) (col. 6, line 47).

Regarding claim 4, Lemnios et al. teaches that the dielectric layer comprises silicon nitride (see col. 7, lines 20-22).

Regarding claim 5, Lemnios et al. teaches that the dielectric layer comprises silicon oxynitride (see col. 7, lines 20-22).

Regarding claims 13 and 15, Lemnios et al. teaches the upper electrode formed of a titanium layer, a platinum layer, and a gold layer (see col. 7, line 49).

Response to Arguments

3. Applicant's arguments with respect to claims 1-5, 11 and 13-15 have been considered but are moot in view of the new ground of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on Monday through Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRD
1/25/05

Tom Thomas
TOM THOMAS
SUPERVISOR
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